

9 H. Keith  
10 Jan 74

# CHEAP COAL;

OR THE

BOSTON AND NORTHWESTERN, MASSACHUSETTS CENTRAL,  
AND BOSTON AND POUGHKEEPSIE RAILROADS:

THEIR RELATIONS TO

MASSACHUSETTS, THE COAL FIELDS OF PENNSYLVANIA,

AND

THE COMMERCE OF BOSTON.

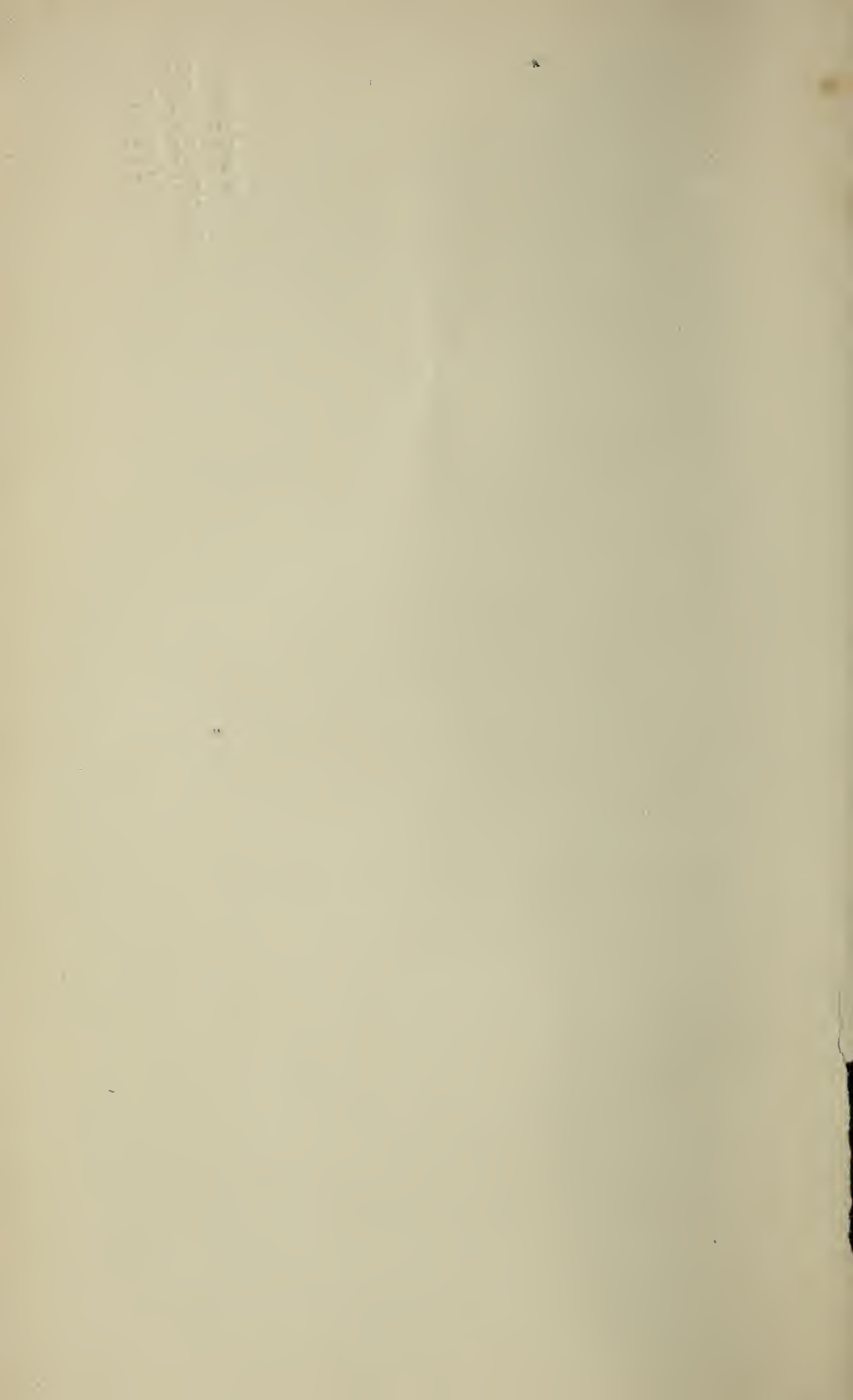
By H. F. KEITH, CIVIL ENGINEER.

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ECONOMICS  
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## CHEAP COAL.

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A NEW railroad enterprise at the present time, to entitle it to public consideration, should possess considerable merit, and be able to supply some commodity to the people at less cost than they now obtain it, or shorten the distance between prominent points.

Before considering at this time a new line, it may be well to give some of the qualifications requisite for a successful line, and the reasons of the failure of so many, whereby almost every railroad enterprise has been brought into disrepute, so that most capitalists at the present time condemn all indiscriminately.

### SOME REASONS OF SUCCESS AND FAILURE.

1. *Local population and manufactures.* A railroad, as a rule, which has a large local population along its line engaged in manufacturing or mining, is successful; but there are exceptions, and there is generally a good reason for it. If most of the populous towns along its line have other and better railroad accommodations which compete with it, and the line runs contrary to the direction of the bulk of the traffic, it will most likely be a failure financially.

2. *Cost.* A railroad, like a mill, ought not to be expected to pay dividends on an inflated cost; but it is often expected that it can.

3. *Poor management* is no better for a railroad than in any other business, although, as a general thing, it will survive this longer than a poorly managed mercantile or manufacturing business.

4. A railroad with a capital corresponding to its business, which runs in the direction of the business which it is to serve, which is well managed, and so located as to be able to compete with others on equal terms as to distance and grades, will always be successful, and survive financial panics that a mercantile and manufacturing business cannot.

#### MASSACHUSETTS CENTRAL RAILROAD.

This railroad was commenced in December, 1871; and at the suspension of the work, at the time of the panic in 1873, there had been expended in grading, masonry, and the settlement of land damages, about \$2,790,000. It is more than two-thirds completed from its eastern terminus at the Waltham line, 12 miles from the Lowell Depot in Boston, through the towns of Weston, Wayland, Sudbury, Hudson, Berlin, Boylston, West Boylston, Holden, Rutland, Oakham, Barre, Hardwich, Enfield, Belchertown, Amherst, and Hadley, to Northampton, 93 miles from Waltham, and 105.2 from Boston; intersecting and easily connecting with the following railroads: viz., the Framingham and Lowell at South Sudbury; branches of the Fitchburg at Hudson, the Boston, Clinton, and Fitchburg, at West

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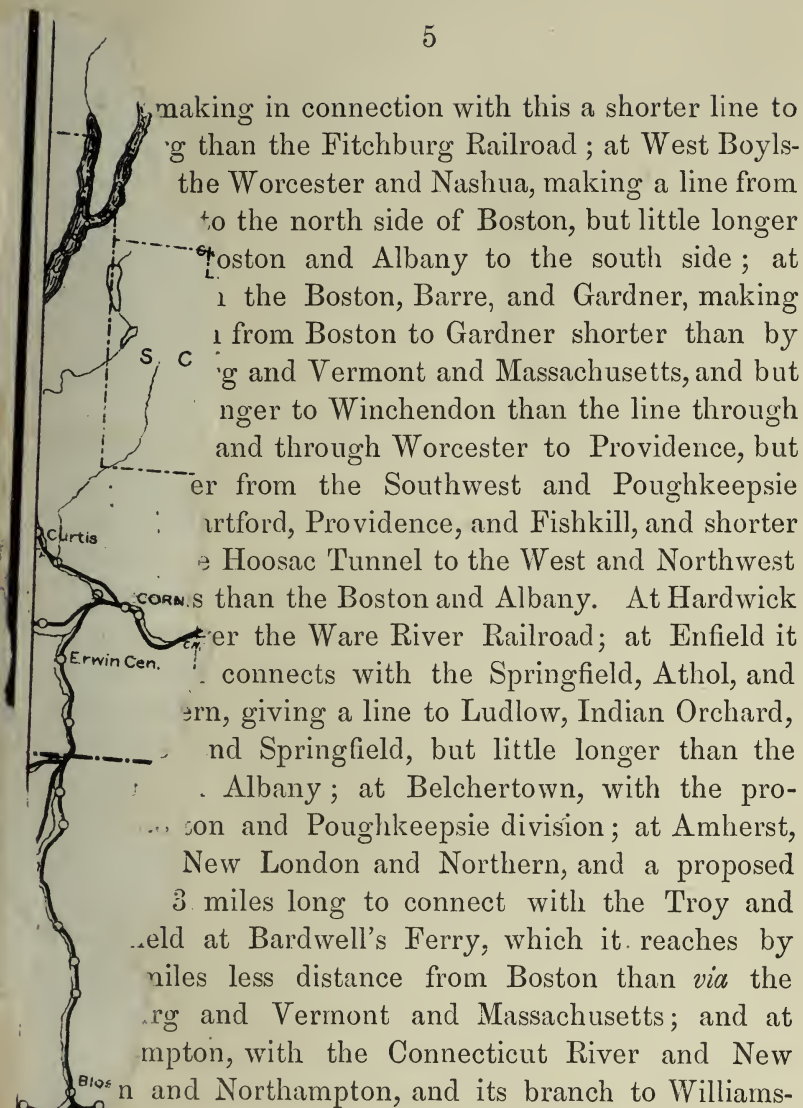
MAP  
OF THE  
BOSTON AND NORTHWESTERN,  
MASSACHUSETTS CENTRAL  
AND  
BOSTON AND POUGHKEEPSIE RAILROADS  
AND THEIR CONNECTIONS.

From the office of  
H. F. WALLING,  
102 Chauncey St.  
BOSTON

BY  
H. F. KEITH, C. E.  
MAY, 1877.

- Completed lines.
- - - Partially constructed do.
- ... Proposed do.
- Principal connections
- Proposed do.





These connecting lines give distribution to almost  
 sections of Eastern New England. The line from  
 Boston to Northampton will cost completed, without  
 costs and equipment, \$4,500,000. It will cost, to

reach the Middlesex Branch of the Lowell Railroad in Somerville, \$500,000 in addition; and, for a complete independent entrance into Boston on South Boston flats, over the Boston and Northwestern, \$1,500,000 more,—a total of \$6,500,000, which sum would allow for about 30 miles of double track near Boston.

#### BOSTON AND POUGHKEEPSIE RAILROAD.

This line will connect at its eastern end with the Massachusetts Central at Belchertown, and thence extend westerly through the towns of Granby and South Hadley and the city of Holyoke to Westfield, 111 miles from Boston by this line and the Massachusetts Central, and 108.3 by the Boston and Albany; or over the Springfield, Athol, and Northeastern from Enfield, through Indian Orchard, Springfield, or Chicopee and West Springfield, to Westfield. From Westfield the line continues through the towns of Southwick, Granville, and Tolland, in Hampden County, rising west to the summit in Tolland, 1,400 feet above the sea, by a maximum ascending grade west of 74 feet per mile for six miles; thence crossing the Farmington valley about one mile south of Cold Spring, by a high bridge, and through the north part of the town of Sandisfield and centre of Monterey, by a maximum descending grade of 66 feet per mile for five miles, to Great Barrington, 151 miles from Boston, where connection is had with the Housatonic Railroad, which will give a large business from the southern section of Berkshire County, the most beautiful and interesting section of Massachusetts. The towns along the line between



Westfield and Great Barrington having, before the construction of the Boston and Albany Railroad, ten per cent more population per square mile than the towns between Westfield and Pittsfield, shows conclusively the natural superiority of this section. They are from 12 to 18 miles from the nearest point on the Boston and Albany, Housatonic, or Connecticut Western, at Winsted; and their business, which now mostly goes to Winsted, might be secured to Massachusetts by this line. From Great Barrington the line passes southerly and westerly through the town of Egremont, crossing the New York State line north of the town of Mount Washington, a summer resort unequalled by any other in New England, for its many attractions, pure air, and accessibility; thence westerly and southerly about six miles to a connection with the Harlem Railroad at Copake (and by a branch west from State line at Hillsdale, giving lines to Hudson and Albany by the construction of a short section of about ten miles). At Copake, connection is had with New York City over the Harlem Railroad; thence crossing said road it next intersects with the Rhinebeck and Connecticut for Rondout and Kingston, the terminus of the Delaware and Hudson Canal and Wallkill Valley branch of the Erie, and the Ulster and Delaware Railroads; and at Ancram, about 14 miles from the State line, with the Poughkeepsie, Hartford, and Boston Railroad, 30 miles to Poughkeepsie, 203 miles from Boston; and at Pine Plains, five miles southward from Ancram, with the Newburgh and Connecticut, leading to Fishkill, 218 miles from Boston by this line, and 227 by the New York and New England.

## POUGHKEEPSIE BRIDGE AND THE COAL TRADE.

The distance and grades from the anthracite coal fields are about the same to Poughkeepsie, as to tide water at Jersey City: therefore the cost of transportation from the mines to Jersey City and Poughkeepsie may be assumed as the same. At Poughkeepsie on the completion of the bridge the coal will start in cars for the interior of New England. At Jersey City it has to be unloaded into elevators, or discharged into boats if ready; thence transported by water to the seaports of New England, unloaded into elevators, and again into cars as wanted. Assuming the waste and cost of reloadings and interest and repairs on wharves and elevators to amount to fifty cents per ton, and adding the water freights, we have the cost of water transportation and delivery on cars at the seaports of New England. New Haven, Providence, and Boston are the most important of these ports; and assuming that 75 cents, \$1, and \$1.25, which is less than the ruling rates of water transportation this year, shall be the average water freights, adding the 50 cents per ton for reloadings, &c., to each, we have the excess in cost on cars at these New England seaports above that at Poughkeepsie, which is as follows: New Haven, \$1.25; Providence, \$1.50; Boston, \$1.75. If we now add to these prices \$1 per ton, the least for which railroads can afford cars and transportation for distances of sixty miles or less, and allow  $1\frac{1}{2}$  cents per ton per mile from Poughkeepsie Bridge, we have the result shown in the following table:—

	Miles Rail.	Cost Water and Rail.	Cost all Rail.	Differ. in favor of all Rail p'r ton.
New Haven to Westfield . . . .	61	\$2.25		
Poughkeepsie to Westfield . . .	92		\$1.38	\$.87
Providence to Worcester . . . .	44	2.50		
Poughkeepsie to Worcester . . .	160		2.40	.10
Boston to South Framingham . .	21	2.75		
Poughkeepsie to So. Framingham,	183		2.75	
Boston to Lowell . . . . .	26	2.75		
Poughkeepsie to Lowell . . . .	198		2.97	+.22

At  $1\frac{1}{2}$  cents per ton per mile, it will be found that the points named above are about on the line of even competition, with the advantage in favor of the all-rail-route, which for the long haul of 150 miles and over could be afforded at less than  $1\frac{1}{2}$  cents per ton per mile, probably one cent. This price would compete with water to points within ten miles of the seaports in Massachusetts. These investigations followed out, it will be found that a line drawn from Poughkeepsie to Danbury, Conn., thence northeast to Windsor Locks, thence to the northeast corner of Connecticut, and from there to Newburyport, Mass., will be about the southern boundary of profitable competition for coal across Poughkeepsie Bridge with water rates; and a line drawn from Poughkeepsie to North Adams, and extended to Canada, will represent the northwestern limit of competition with lines north of Albany owned and operated by the Delaware and Hudson Canal Co. *To make the Poughkeepsie Bridge of any use to Massachusetts in the cheapening of the cost of coal or other freights from the Erie and Pennsylvania or other railroads, it will be found, on applying the preceding principles of comparative*



*cost of water and rail transportation, that the construction of the proposed Boston and Poughkeepsie Railroad, from a connection with the Poughkeepsie, Hartford, and Boston Railroad, to the Connecticut Valley in Massachusetts, is an essential part.* The route selected, 160 miles, through Massachusetts is the shortest possible, being but 203 miles from Boston to Poughkeepsie, while the New York and New England and Connecticut Western, or the proposed line *via* Waterbury, are both from 226 to 227 miles between these points; and there is abundant testimony against the feasibility of any shorter route between those lines; and my own investigations have led to the same conclusion.

The Connecticut Western, and New York and New England, do not reach any part of Massachusetts where they can compete with water transportation for coal, or western freights. The section of Massachusetts, Vermont, and New Hampshire, which the Boston and Poughkeepsie and Massachusetts Central can supply with coal at an average of fifty cents per ton less than any other line, consume 1,500,000 tons per annum. This will require nearly fifty trains every working day in the year to transport. The line will cost from Ancram to the Connecticut Valley, with equipment, about \$3,000,000. The average haul will be about seventy miles, for which it would be safe to say it would receive one dollar per ton. This would amount to \$750,000 for half the business; thirty per cent of this would be net profit, or \$225,000, or over seven per cent on its cost for one-half the coal traffic alone, and at an average saving to the consumer of fifty cents per ton.

## GENERAL FREIGHT AND PASSENGER TRAFFIC.

The line as a through passenger and general freight route to Philadelphia, Baltimore, Washington, and the South and Southwest, is destined to be unrivalled, as the distance to all points in Pennsylvania and to the South from Northern and Eastern Massachusetts, is but little farther than through New York City in miles, and in time less, and no transfers on completion of the Poughkeepsie Bridge. As a line to the interior of Massachusetts, Boston, and the towns and cities northeast of Boston, for the Pennsylvania, Baltimore and Ohio and Erie Railroads, it is unrivalled, being twelve per cent the shortest all-rail line south of Albany to all points in Massachusetts and eastern New England.

By the following table of comparative distances and accompanying map, it will be seen that the Massachusetts Central and Boston and Poughkeepsie Railroads not only make the shortest line from Boston to all points on the Hudson River from Albany to Fishkill with easy grades, but has the important advantage of using its entire line — 160 miles — through Massachusetts to reach all points south of Albany, and 88 miles for its Hoosac Tunnel connection. By its connections and branches, it reaches the entire population of the Connecticut Valley in Massachusetts, with a population of over 100,000 within ten miles of the city of Holyoke, which of itself contains a population of over 17,000, and has increased more rapidly the last ten years than any town or city in the State. These connections and branches give distribution for coal to almost every part of Massachusetts, and bring to

Boston the trade of the Connecticut Valley by a shorter line than either the Fitchburg or Boston and Albany Railroads. The local and tributary population per mile for the first one hundred miles from Boston is 888 on the Fitchburg, and 1,052 on this line.

*add Boston*  

$$\begin{array}{r} 3419 \\ 4471 \\ \hline \end{array}$$

TABLE OF COMPARATIVE DISTANCES FROM BOSTON.

	Mass. Central, & Boston & Pough- keepsie and con- nections.	Other Lines.	Difference more or less by Mass. Cen- tral.
Boston to Fitchburg . . . . .	49.5	50.	— 0.5
“ “ Worcester . . . . .	47	44.	+ 3.
“ “ Gardner . . . . .	62.7	65.	— 2.3
“ “ Winchendon . . . . .	72.7	68.	+ 4.7
“ “ Springfield . . . . .	108.4	98.3	+ 10.1
“ “ Chicopee . . . . .	105.4	101.3	+ 4.1
“ “ Amherst . . . . .	97.7	103.	— 5.3
“ “ Northampton . . . . .	105.2	115.3	— 10.1
“ “ Bardwell's Ferry . . . . .	111.	114.	— 3.0
“ “ North Adams . . . . .	141.	144.	— 3.0
“ “ Schenectady . . . . .	198.	218.6	— 20.6
“ “ Holyoke . . . . .	100.3	106.3	— 6.
“ “ Westfield . . . . .	111.	108.3	+ 2.7
“ “ Cold Spring . . . . .	135.		
“ “ Great Barrington . . . . .	151.	176.	— 25.
“ “ Lee . . . . .	151.5	162.	— 10.5
“ “ State Line, W. Stockbr'ge	161.4	162.	— 0.6
“ “ Hillsdale . . . . .	162.4	195.	— 32.6
“ “ Hudson . . . . .	179.4	194.3	— 14.9
“ “ Albany . . . . .	204.	201.6	+ 2.4
“ “ Copake . . . . .	165.2	196.	— 30.8
“ “ Rhinebeck . . . . .	199.		
“ “ Poughkeepsie . . . . .	203.	227.	— 24.
“ “ Fishkill . . . . .	218.	227.	— 9.
“ “ Newburgh . . . . .	219.	228.	— 9.
“ “ Newark . . . . .	280.	245.	+ 35
“ “ Philadelphia . . . . .	361.	326.	+ 35.



COMPARATIVE ESTIMATED COST OF THE BOSTON AND  
NORTHWESTERN MASSACHUSETTS CENTRAL AND BOS-  
TON AND POUGHKEEPSIE RAILROADS WITH OTHER  
LINES LEADING WEST FROM BOSTON.

	Totals.	Branches.	Main Line.	Cost.	Remarks.
Boston to Somerville (B. & Lowell)	3	. . .	3	. . .	In operation.
Somerville to Weston . . . . .	9	. . .	9	\$500,000	Surveyed and est.
Weston to Northampton . . . . .	93	— 17	76	4,500,000	\$2,790,000 expend.
Belchertown to N.Y. State Line .	71	. . .	71	2,650,000	Surveyed and est.
New York Line to Ancram . . . . .	14	. . .	14	350,000	Examined.
Ancram to Poughkeepsie . . . . .	43	— 13	30	1,000,000	In operation.
Total cost and distance . . . . .	233	— 30	203	\$9,000,000	
Less 30 miles of branches at \$40,000 per mile . . . . .				1,200,000	
				\$7,800,000	
Add for independent entrance into Boston over B. & N. W. .				1,500,000	
Add cost to double track to Poughkeepsie . . . . .				3,200,000	
Total cost double track, steel rails, Boston to Poughkeepsie				\$12,500,000	
Cost of Boston and Albany, from R. R. Commissioner's Re- port, exclusive of equipment, stations, branches, &c. .				\$18,700,000	
Balance in favor of proposed Boston & Poughkeepsie line				\$6,200,000	

The average cost of the New York and New England completed to Poughkeepsie, the Fitchburg to the Hudson River, and the Boston and Albany all double-tracked, without equipment, &c., is about \$25,000,000, or double the cost of this line, which in one combines all the advantages which the other three possess as through lines to all prominent points.

## PROSPECTUS OF BOSTON AND POUGHKEEPSIE DIVISION.

Having described the line, its grades, and cost, it seems appropriate to give some of the reasons for its immediate construction, and its prospects of paying if constructed.

### REASONS FOR ITS IMMEDIATE CONSTRUCTION.

1. It is the shortest, cheapest, and best line possible from Boston to Albany, Hudson, Rondout, Poughkeepsie, and Fishkill.

2 It shortens the distance from Boston to the Poughkeepsie Bridge now under construction, 24 miles, or more than ten per cent, over any other line, and will consequently cheapen the cost of transportation that per cent on all freight coming over said bridge to Massachusetts and the other New England States east of the Connecticut River.

3. It can save in the one item of coal alone one-third the cost of the railroad annually, in addition to paying seven per cent dividends to its owners.

4. It will give local accommodation to a valuable and interesting section of the State, now from 12 to 18 miles from the nearest railroad station, and renders valuable their unoccupied water-power, forests of timber, quarries of marble and granite, and mines of iron and other ores, and shortens the distance from all towns in Southern Berkshire to Boston and New York from 20 to 25 miles.

5. It can be built now, with the low price of labor and materials, at a cost that will give it a decided advantage over those built at inflated prices, and give employment to many now needing it, and a useful investment for unemployed capital, with a good prospect of profitable dividends.

BOSTON AND NORTHWESTERN RAILROAD, ITS RELATION TO THE MASSACHUSETTS CENTRAL AND BOSTON AND POUGHKEEPSIE RAILROADS, AND THE COMMERCE OF BOSTON.

Having examined the Massachusetts Central, and proposed Boston and Poughkeepsie Railroads, and their connections, and found that they combine all the elements of value as through lines, that the Fitchburg, Boston and Albany, and New York and New England, possess, and when completed will have only one-sixth of the capital of those roads, and that the Massachusetts Central has expended very little in the construction of its line east of the western terminus of the proposed Boston and Northwestern Railroad, which will make the cheapest and most advantageous connection with the unequalled terminal grounds at South Boston Flats, not only for those lines and their connections, but for the Boston and Albany, Fitchburg, Woonsocket division of the New York and New England, and Boston and Providence, let us examine the merits of the Boston and Northwestern itself, and its relations to commerce and manufactures.

Its construction will concentrate the heavy freight business of these railroads and their connections at South Boston Flats, easily accessible to the wholesale



trade of the city; and insure the construction and co-operation of the Massachusetts Central, and proposed Boston and Poughkeepsie, giving it with their connections an independent connection of its own with the Connecticut Valley, the Hoosac Tunnel, Poughkeepsie Bridge, and Montreal, shorter than either of the other lines. Such being the intimate connection of the Boston and Northwestern with these lines reaching all important points with the shortest and best line, let us consider the opportunities and advantages which it will give the State in the promotion of its internal industries and to the trade and commerce of Boston.

First let us examine the geographical position of the State with regard to New England, Canada, and the British Provinces and the United States. It is the most central, prosperous, and densely populated of any of the New England States. Its water-power, variety of scenery, and social and educational advantages, are unequalled by any State in the Union. It contains nearly one-half the population of New England. Boston, its capital and principal seaport, has a population of 500,000 within ten miles of the State House. It is on the direct line between the East and the West, being directly east of the Mohawk Valley, the best natural route to the Atlantic seaboard from the Mississippi Valley. It is on the direct highway between Maine, New Hampshire, and the British Provinces, and Southern New England and the Southwest. Boston and Massachusetts Bay is the natural centre for the fishing interest of New England and the British Provinces, having a coast-line of its own of nearly 300 miles exclusive of its islands. It is the greatest wool,

boot-and-shoe, and leather market in the country, and contains with New Hampshire and Rhode Island nearly two-thirds the cotton spindles in the United States, and is intimately connected by rail and water with New England, Canada, and the British Provinces, containing a total population of about 8,000,000. Admitting that we now stand at the head in all these industries, and that we have this large population naturally tributary, what can we do to preserve and increase this advantageous position ?

Probably all will admit that our railway connections with Northern New England, Canada, and the Provinces, are sufficiently numerous ; and also with Rhode Island, Connecticut and New York City, to which we have no less than four lines. All will also admit that it is utterly useless to expect lines in that direction to bring trade to Boston from points beyond Northern Rhode Island and Northeastern Connecticut, and that every railway in that direction or through Connecticut tends to build up New York more than Boston ; that even the Connecticut Valley in our own State, with a population of over 175,000, is now largely tributary to New York City, and Berkshire County, with about 75,000 additional, wholly. This is a matter which we can and should remedy. The Massachusetts Central and its connections make the shortest line from almost every city and town in the Connecticut Valley, between Springfield and Greenfield ; and, with quick and cheap trains from the Connecticut Valley to Boston, would turn this trade east instead of south as is now the case by the Boston and Albany, Connecticut River, New York, New Haven, and Hartford, and New

Haven and Northampton Railroads. Do this, and build the Boston and Poughkeepsie through Southern Berkshire, requiring the construction of but 50 miles in our own State to complete the only link necessary to make a line from Boston to Poughkeepsie 24 miles shorter than the New York and New England through Connecticut, and you control the trade of the 75,000 inhabitants in Berkshire County who desire to trade in the capital of their own State. Having considered our local New England railway system, and finding that improved transportation through Connecticut tends to carry our trade to New York City, a disadvantage to us; that the competition which we will have from Western Massachusetts to Boston by the completion of the Massachusetts Central and Boston and Poughkeepsie will concentrate the bulk of the trade of the western portion of our State with 250,000 inhabitants at Boston, instead of New York as at present, and that the trade to the north and northeast is naturally ours now, and needs but the improvement of existing lines to increase it,—let us now extend our investigations to that which is of especial interest to the commerce of Boston.

Foreign commerce, to be successful, is as dependent on return freight as plenty to export. New England being the centre of the manufacturing industry of the country, contains a dense population, who are consequently large consumers of foreign importations both of luxuries and the raw material for our manufactures. Including Canada and the British Provinces we have a population of about 8,000,000, directly tributary to Boston by the railway system of New England. The



trade of Canada through Montreal has been seeking export through Boston for several years, but finds no adequate terminal and shipping facilities with which to connect the railways in that direction with our shipping. The policy of equal through rates to Europe from the West, through all Atlantic seaports, now so objectionable to us, would be largely overcome if we had the superior terminal grounds at South Boston developed, and connected with the railway system of the State as proposed by the Boston and Northwestern Railroad Company. The admirable system which it is possible to secure there would also largely tend to induce the construction of a railway from Lake Ontario to a connection with the Hoosac Tunnel. Business and freight will go where it can be handled cheapest, especially when it is on the direct line of its destination, and can secure large return freights.

With the Massachusetts Central and Boston and Poughkeepsie, and their connections, built and to be built by the local interest, can Boston with more than one-third the entire capital of the State afford to withhold the sum necessary to provide the way into the city to a point so convenient to its wholesale trade as South Boston Flats? Give these lines an independent entrance into Boston, and you bring here the trade of 250,000 inhabitants in Western Massachusetts now almost wholly tributary to New York. Construct the Boston and Northwestern Railroad with elevator and warehouse accommodations, and you at once secure the winter export of Montreal, and open and provide the way for new lines of great value to the West and Southwest.

## WILL THESE LINES PAY?

Absolute proof on this point can be given of no new enterprise ; but, if we admit that this line has the average merits of the other railroads of Massachusetts, we can arrive at but one decision.

1st, The single track mileage of all descriptions in this State, according to the Railroad Commissioners' report of 1875, is 3,778 miles ; the total cost without equipment is \$157,999,803, an average of \$41,821 per mile of single track. The net earnings per mile of single track are \$2,553, or six per cent on a cost of \$42,500 per mile. The total single track mileage of the Boston and Northwestern, Massachusetts Central, and Boston and Poughkeepsie, will be 250 miles at a total cost of \$9,300,000, an average of \$37,200 per mile. The average equipment per mile of the railways of the State is \$4,932 : this added to the cost of the Massachusetts Central, and Boston and Poughkeepsie, per mile is \$42,132, a cost on which over six per cent is being paid on every mile of track in Massachusetts during the most depressed period which has been experienced since the construction of railroads.

In comparing this cost with the Boston, Clinton, and Fitchburg, Eastern, and New York and New England, per mile, of less than the average merit as local or through lines, we shall find that high cost per mile is the first primary cause of all their troubles, as well as almost all the Western roads which with far less local population than in Massachusetts have cost more per mile.

While the towns and cities throughout the State

have been building railways in all directions to develop their interests, Boston has done nothing to develop her interests for forty years. Boston capitalists, while spending a hundred millions in Western railroads with great subsidies, have found they can only earn six or seven per cent on a fair cost; their predecessors, who forty years ago built the Boston and Worcester, Western, and Boston and Providence, and other railroads leading out of Boston, are getting a better return for their investment, and are also entitled to the credit of the past growth of the city. Forty years ago, they, with a far smaller capital, raised several millions: can modern Boston raise two to-day?

HERBERT F. KEITH,

*Civil Engineer.*













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